

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS**

SINGULAR COMPUTING LLC,

Plaintiff,

v.

GOOGLE LLC,

Defendant.

C.A. No. 1:19-cv-12551-FDS

Hon. F. Dennis Saylor IV

**DEFENDANT GOOGLE LLC'S OPPOSITION TO PLAINTIFF SINGULAR
COMPUTING LLC'S MOTION FOR PARTIAL SUMMARY JUDGMENT OF
VALIDITY BASED UPON IPR ESTOPPEL UNDER 35 U.S.C. § 315(e)(2)**

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I. INTRODUCTION

Singular’s motion for partial summary judgment of validity should be denied because it is both fatally superficial and meritless.

First, Singular’s motion is so cursory that it cannot satisfy Singular’s burden to demonstrate the absence of any genuine issue of fact, and should be denied on this basis alone. Singular’s motion is premised on the incorrect *assumption* that Google intends to advance at trial invalidity grounds that Google “raised or reasonably could have raised” during the *inter partes* review (“IPR”) proceedings Google initiated against Singular’s patents. *See* 35 U.S.C. § 315(e)(2). Without any analysis of the specific grounds (and accompanying evidence) that Google may actually advance at trial, Singular has failed to satisfy its burden of demonstrating it is entitled to summary judgment, especially since Singular bears the burden of showing that estoppel applies.

Second, and more fundamentally, Singular’s motion lacks merit because the invalidity grounds that Google will seek to present at trial were not grounds Google raised or reasonably could have raised during the IPR proceedings. Instead, Google intends to argue to the jury that the two asserted claims are unpatentable because the “invention” recited in those claims was either (i) “known or used by others in this country,”¹ (ii) “in public use,”² and/or (iii) invented “by another”³ as evidenced by certain prior-art computing *systems*. Google’s **system-based** invalidity grounds, however, are not patent-or-printed-publication-based grounds that Google could have raised in its IPR petitions; thus, they are not grounds that Section 315(e)(2) bars Google from pursuing at trial. Specifically, Google intends to show the jury that three separate prior-art

¹ 35 U.S.C. § 102(a). All citations to Sections 102 and 103 are to the pre-AIA statute.

² 35 U.S.C. § 102(b).

³ 35 U.S.C. § 102(g)(2).

computing systems—the VFLOAT, CNAPS, and GRAPE-3 systems—existed before Singular filed its patent application and that those prior-art systems alone anticipate or, either alone or in combination with other prior art, render obvious the claimed “inventions.”

Singular’s contention that Google is estopped from relying on prior-art systems simply because some aspects of those systems may have been described in printed publications is without merit. Dkt. No. 377-1 (“Mot.”) at 7. Google is not relying ***only*** on printed publications to show how the prior-art systems functioned; it is also materially relying on significant additional sources of evidence, such as contemporaneous source code as well as percipient testimony describing both how the systems operated and how they were publicly known or used in this country. Singular’s motion therefore should be denied because Google’s grounds are not ones it could have raised in the IPR proceedings. Indeed, this Court reached a similar conclusion on similar facts in *SiOnyx, LLC v. Hamamatsu Photonics K.K.*, 330 F. Supp. 3d 574 (D. Mass. 2018), and none of Singular’s cited cases suggest that the Court should reach a contrary conclusion here.

Finally, although the Court need not reach this issue, even if Google were relying on only printed publications to prove its system-based prior-art invalidity grounds, IPR estoppel would still not apply. The statutory text is clear and unambiguous. By its plain language, estoppel only applies to invalidity grounds under 35 U.S.C. §§ 102 and 103 that consist of patents or printed publications, i.e., grounds premised exclusively on the invention being “***patented*** or ***described*** in a printed publication in this or a foreign country.” 35 U.S.C. § 102(a)-(b). The plain import is that estoppel does not apply to other grounds of invalidity—like Google’s—even if some of the ***evidence*** for those grounds could theoretically have been used to advance a patent-or-printed-publication ground of invalidity. If the Court reaches this issue—which it need not—it should join the many other district courts that have concluded that IPR estoppel cannot apply to prior-art

system invalidity grounds regardless of the type of evidence used to support those grounds.

II. ARGUMENT

To prevail on summary judgment, Singular must show that “there is no genuine dispute as to any material fact and [that Singular] is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(a). “All reasonable inferences are to be drawn in favor of the party opposing summary judgment, in this case [Google], just as all disputed facts are viewed in the light most favorable to [Google].” *O’Connor v. Steeves*, 994 F.2d 905, 907 (1st Cir. 1993).

A. Singular’s Motion Must Be Denied Outright for Failure to Address the Actual Invalidity Grounds and Evidence Google Intends to Present at Trial.

There is no dispute that Singular bears the burden to show that estoppel applies. Mot. at 3; *see also SiOnyx*, 330 F. Supp. 3d at 602. As the party moving for summary judgment on an issue that it bears the burden of proving, Singular “cannot prevail unless the evidence that [it] provides on that issue is *conclusive*.” *E.E.O.C. v. Union Independiente de la Autoridad de Acueductos y Alcantarillados de Puerto Rico*, 279 F.3d 49, 55 (1st Cir. 2002) (cleaned up). Yet Singular’s motion—which broadly seeks to eliminate Google’s entire prior-art invalidity case on the basis of estoppel—does not even attempt to engage with the specific grounds and supporting evidence that Google may *actually* present at trial, nor could it do so, because Singular elected to file its motion nearly two months before Google’s invalidity expert reports are due. *See* Dkt. No. 377 (motion filed Nov. 3); Dkt. No. 386 (initial expert reports due Dec. 22). Indeed, Singular’s motion is so superficial it does not even *mention* two of the three computing systems that Google intends to offer as invalidating prior art (VFLOAT and CNAPS), let alone conclusively demonstrate that Google is estopped from relying on those systems under Section 315(e)(2). And the third system (GRAPE-3) is mentioned only in passing and only as an “example” of the “purported prior art devices” disclosed in Google’s invalidity contentions and accompanying claim charts. Mot. at 6-

7. The Court can and should deny summary judgment on this basis alone, without proceeding any further, because Singular’s superficial motion fails to discharge its initial burden as a summary judgment movant. *See NEPSK, Inc. v. Town of Houlton*, 283 F.3d 1, 7 (1st Cir. 2002) (“[W]here the evidentiary matter in support of the motion does not establish the absence of a genuine issue, summary judgment must be denied even if no opposing evidentiary matter is presented.”).

Moreover, as will be apparent from the forthcoming reports of Google’s invalidity experts, the invalidity grounds Google intends to present at trial will be that these prior-art computing systems invalidate Singular’s asserted patent claims as anticipated and/or obvious because they were “known or used . . . in this country” under Section 102(a), were in “public use . . . in this country” under Section 102(b), and/or had been “made in this country by another inventor who had not abandoned, suppressed, or concealed [them]” under Section 102(g)(2). “Unlike an invalidity theory that simply relies on one or more prior-art reference documents,” an invalidity ground that a prior-art system was “‘known or used’ is more likely to implicate highly factual evidence in the form of testimony and contemporaneous documentation.” *Cal. Inst. of Tech. v. Broadcom Ltd.*, 2019 WL 8192255, at *10 (C.D. Cal. Aug. 9, 2019), *order corrected*, 2019 WL 8807924 (C.D. Cal. Nov. 21, 2019). Singular’s motion entirely fails to address any of the fact-intensive issues for the VFLOAT, CNAPS, or GRAPE-3 prior-art systems, much less demonstrate that there is no genuine dispute of fact that Google’s *actual* invalidity grounds are estopped.⁴ Singular does not engage with or even mention, for example, the witness testimony, public presentations, source code, and non-public details that Google intends to present regarding the VFLOAT system, as outlined below. *See* Section II.B.1.a, *infra*. Similarly, Singular fails to

⁴ It would be improper for Singular to address these facts for the first time in reply. *Hilsinger Co. v. Kleen Concepts, LLC*, No. CV 14-14714-FDS, 2017 WL 3841468, at *7 (D. Mass. Sept. 1, 2017).

address or even discuss the witness testimony and non-public materials Google intends to present regarding the CNAPS system. *See Section II.B.1.b, infra.*

Singular has opted at its peril to seek summary judgment with only cursory and superficial arguments that do not engage with—and largely do not even mention—the actual invalidity grounds Google intends to present at trial. Its motion should be denied on this basis alone.

B. IPR Estoppel Does Not Apply to Google’s Actual Invalidity Grounds

As Singular concedes (and as this Court recognized in *SiOnyx*), prior-art devices or systems “cannot be relied upon as invalidity prior art in IPR proceedings.” Mot. at 6; *see also SiOnyx*, 330 F.3d at 603. It follows naturally that once an IPR concludes, a defendant is not estopped from pursuing in district court invalidity grounds premised on prior-art devices or systems. 35 U.S.C. § 315(e)(2) (limiting estoppel to grounds that were “raised or reasonably could have [been] raised” during the IPR); *SiOnyx*, 330 F.3d at 603 (holding that IPR estoppel did not prevent defendant from arguing that claims would have been obvious in view of a prior-art product that could not have been raised in the IPR, including in combination with several printed-publication references that were raised in the IPR). Singular does not contend otherwise.

Singular likewise does not dispute that Google adequately disclosed that it would be relying on prior-art systems as a basis for invalidity. Mot. at 6 (conceding that Google’s “claim charts disclose several purported prior art devices”). The *only* basis for Singular’s motion seems to be its meritless contention—in reality, an *assumption* that it makes no effort to conclusively establish—that Google’s previously identified prior-art systems “are described solely” in printed-publication references that Google could have raised in the IPR proceedings, and thus, according to Singular, Google is trying to “dress[] up” a printed-publication invalidity defense as a prior-art system invalidity defense to avoid estoppel. *Id.* at 7-8.

But Singular has not even attempted to carry its burden of conclusively showing that

Google is “dressing up” a printed-publication invalidity defense as a prior-art system. *See SiOnyx*, 330 F. Supp. 3d at 603–04 (patentee bears “burden to show that publicly available materials are the ‘real’ references that defendants are now trying to pass off as the product itself”). And Google is doing no such thing. As explained in detail *infra* Section II.B.1, each of Google’s three prior-art system grounds relies on evidence that is ***not a printed publication***. In other words, Google’s experts are not relying on printed publications ***alone*** to demonstrate invalidity; they are relying on printed publications in combination with other non-printed-publication sources of evidence such as source code or percipient witness testimony to prove that the prior-art systems disclose all elements of the asserted claims and were, for example, “known or used by others in this country” before Singular filed its original patent application. As shown *infra* Section II.B.2-3, this Court and others have found IPR estoppel does not bar defendants from doing precisely what Google is doing, i.e., using printed-publication references to corroborate the details of prior-art *systems*, and none of Singular’s cited cases suggest a different outcome here.

1. **Singular has failed to carry its burden of showing that there is no genuine issue of material fact as to whether IPR estoppel applies to Google’s three prior-art systems.**
 - a. **The VFLOAT System.**

Singular has failed to carry its burden of showing that there is no genuine issue of material fact as to whether Section 315(e)(2) estops Google from proving invalidity based on the VFLOAT system. *See SiOnyx*, 330 F. Supp. 3d at 603–04. Indeed, it cites almost none of the key evidence bearing on that question.

Google’s forthcoming expert reports will show that Google seeks to prove invalidity at trial based on prior public knowledge, public use, and/or prior invention of and relating to the VFLOAT

system operating on FPGA hardware,⁵ which was developed, reduced to practice, and in public use by approximately 2002 by Miriam Leeser, a Northeastern University professor, and graduate students whom she supervised. Leeser Decl.⁶ ¶¶ 1-4, 22; J.G. Decl.⁷ ¶¶ 7-12. As Dr. Leeser will testify at trial, in connection with a subcontract that Los Alamos National Laboratory awarded to Northeastern University, she and her graduate students developed a library of parameterized hardware modules, written in VHDL code,⁸ for performing variable-precision arithmetic on floating-point numbers with custom formats, which library they later named “VFLOAT.”⁹ Leeser Decl. ¶¶ 4-6. Using a workstation in Northeastern’s Reconfigurable Computing Laboratory (RCL), Dr. Leeser and her students mapped VFLOAT to actual FPGA hardware in a process analogous to compiling and executing other types of computer source code, in order to (among other things) validate and demonstrate VFLOAT’s capabilities. *Id.* ¶¶ 4, 6-7. In addition, Dr. Leeser and her graduate students publicly disclosed various aspects of their work in conferences, workshops and other public proceedings—for example, by describing how VFLOAT operating on FPGA hardware could be used to perform *k*-means clustering on hyperspectral satellite imagery. *Id.* ¶¶ 18, 20-25. The VFLOAT system operating on FPGA hardware anticipates and/or renders obvious the asserted claims as “known or used by others in this country” under Section 102(a), as a “public use” of the claimed invention under Section 102(b), and as a prior invention that was not abandoned, suppressed, or concealed under Section 102(g)(2).

⁵ “FPGA” means Field-Programmable Gate Array, a type of reconfigurable computing hardware.

⁶ “Leeser Decl.” refers to the attached Declaration of Miriam Lesser.

⁷ “J.G. Decl.” refers to the attached Declaration of Dr. John L. Gustafson.

⁸ “VHDL” is an acronym for “VHSIC Hardware Description Language,” which is a type of computer code for defining the behavior of electronic circuits, most commonly digital circuits.

⁹ Google identified Dr. Leeser in its initial disclosures under Federal Rule of Civil Procedure 26(a)(1). Singular opted not to depose her during the fact discovery period.

Singular’s motion fails to carry its burden of showing that there is no genuine issue of material fact as to whether Section 315(e)(2) estops Google from proving invalidity based on the VFLOAT system.¹⁰ The motion completely fails to address the key evidence that Google may rely on to prove invalidity based on the VFLOAT system, which includes:

- The 2002-era VHDL source code for VFLOAT
- Public, oral presentations by Dr. Leeser and her graduate students regarding VFLOAT and its use on FPGA hardware, which show that the system was in public use, publicly known, and not abandoned, suppressed, or concealed
- The percipient testimony of Dr. Leeser, based on her recollection and corroborated by both non-public and public documents, regarding the development, use, and public disclosures of and relating to VFLOAT
- Non-public details regarding the workstation Dr. Leeser and her team in the RCL used in connection with VFLOAT that are material to proving the system meets or satisfies certain claim limitations
- The written thesis of one of Dr. Leeser’s graduate students, Pavle Belanović, which corroborates certain aspects of Dr. Leeser’s testimony

Importantly, Google’s actual invalidity grounds based on VFLOAT could not have been asserted in IPR because they are not “ground[s] that could be raised under section 102 or 103 ... on the basis of prior art consisting of patents or printed publications,” 35 U.S.C. § 311(b), and Google’s supporting evidence is not cumulative of anything Singular suggests is a printed publication. For example, the non-public parameters of the workstation Dr. Leeser and her team in the RCL used in connection with VFLOAT are material to proving that the system satisfied limitations of the asserted claims related to the “number of execution units in the device adapted to execute at least the operation of multiplication on floating point numbers that are at least 32 bits

¹⁰ As the Court observed in its order granting-in-part Google’s motion for leave to supplement its non-infringement and invalidity contentions, “Google referred to Belanović/Lesser, CNAPS, and Cray T3D as ‘systems’ in its earlier invalidity contentions, which presumably exempts them from the application of IPR estoppel.” Dkt. No. 375 at 4 n.3.

wide.”¹¹ See J.G. Decl. ¶ 10. The number of such execution units in the workstation that Dr. Leeser and her graduate students used with VFLOAT is not explicitly disclosed in any of the materials that Singular claims are “printed publications” that could have been asserted as the basis for IPR. *Id.* ¶ 8. Likewise, the complete VHDL code for VFLOAT is not disclosed in any of the publications that Singular claims could have been raised as the basis for IPR. Similarly, the oral presentations given by Dr. Leeser and her graduate students could not have been raised in IPR proceedings under Section 311(b), and Singular does not contend otherwise. For these reasons, Singular’s motion should be denied as to the VFLOAT system.

b. The CNAPS System.

The Connected Network of Adaptive Processors (CNAPS) was a system built by Adaptive Solutions, Inc. starting in 1990, about 20 years before Singular filed its original patent application. Specifically, CNAPS was a high-performance chipset for image processing, neural-network emulation, and pattern recognition that was available with either 64 or 16 processor nodes per chip. Up to 8 chips could be under common control of the CNAPS Sequencer Chips (CSC). Each of the CNAPS chips used a low-precision format of 1, 8, or 16 bits. Rather than use a floating-point format, however, CNAPS used a fixed-point format. The multiple processor nodes operated in parallel; included 4KB of local, on-chip memory; and had arithmetic circuitry that could include an adder and a multiplier, among other things such as registers and a logic unit.

Google disclosed CNAPS as a prior-art system in its invalidity contentions, including by providing a related chart and detailed disclosures in the cover pleading. Dkt. Nos. 377-11, 377-14 (Gannon Decl. Exs. H, K). The chart cites to various pieces of evidence regarding the CNAPS chips and the system they were used in. *Id.* This includes various non-public materials produced

¹¹ E.g., ’273 patent, claim 43, from which asserted claim 53 depends.

in response to a third-party subpoena to Dr. Dan Hammerstrom, founder and Chief Technology Officer of Adaptive Solutions, who designed the CNAPS chip. *Id.*

At his deposition, Dr. Hammerstrom described [REDACTED]

[REDACTED]. Ex. 1¹² at pp. 36-40, 47-51, 59-61. [REDACTED]

[REDACTED]. *Id.* at 41, 65-68. [REDACTED]

[REDACTED]. *Id.* at 64-65.

Google’s forthcoming expert reports will show that Google seeks to prove at trial that CNAPS in combination with other prior art, such as an article authored by Mr. Belanović and Dr. Leeser¹³ or Shirazi,¹⁴ renders the asserted claims obvious. J.G. Decl. ¶¶ 13–17. In particular, as its invalidity contentions previewed, Google contends it would have been obvious to those skilled in the art to adapt a system like CNAPS to use a floating-point format. *Id.* ¶ 16. Indeed, “whether to use fixed or floating point calculations is simply a design choice for one skilled in the art.” *Tech. for Energy Corp. v. Computational Sys., Inc.*, 6 F.3d 788, at *3 n.1 (Fed. Cir. 1993) (adopting conclusion of expert witness). Because this combination uses the CNAPS system—a prior-art system whose existence will be proven up by Dr. Hammerstrom’s testimony and personal documents, among other evidence, *see* J.G. Decl. ¶¶ 15–16—Google could not have advanced it as grounds for IPR. Under the statute, Google is not estopped from relying on this obviousness argument. In any event, Singular has made no effort to carry its burden of showing that Dr.

¹² Unless stated otherwise, “Ex.” means exhibits to the attached Declaration of Anna Porto.

¹³ P. Belanović, & M. Leeser, *A Library of Parameterized Floating-Point Modules and Their Use*, Proc. Of Int’l Conf. on Field Programmable Logic and Applications (Springer-Verlag 2002).

¹⁴ N. Shirazi et al., *Quantitative Analysis of Floating Point Arithmetic on FPGA Based Custom Computing Machines*, Proc. IEEE Symp. FPGAs for Custom Computing Machines (IEEE 1995).

Hammerstrom's testimony and personal documents qualify as, or are cumulative of any, printed publication describing CNAPS. Singular's motion should therefore be denied as to CNAPS.

c. The GRAPE-3 System.

The GRAPE-3 system was a special-purpose computer designed and built to accelerate mathematical simulations of the evolution of astronomical objects, such as our solar system, galaxies, star clusters, and other “large-scale structures of the universe.” Ex. 2¹⁵ at 165. GRAPE-3 was the third in a series of GRAPE (short for GRAvity PipE) computing systems developed at the University of Tokyo, and deployed throughout the world. *Id.*

The GRAPE-3 System used, among other number formats, a logarithmic number system (LNS) format with 14 bits. Google’s forthcoming expert reports will show that Google seeks to prove invalidity at trial through expert testimony that the GRAPE-3 system’s implementation of a logarithmic number system for certain operations, including addition, meets the asserted claims’ error and dynamic range limitations, and thus anticipated by many years the claimed “low-precision high dynamic range execution unit.” J.G. Decl. ¶¶ 18–21. Furthermore, the GRAPE-3 system used parallel processing, and thus had many such LPHDR execution units in a single GRAPE-3 system. Thus, the system also anticipates the limitation that the number of LPHDR execution units exceed by at least 100 the number of execution units performing at least the operation of multiplication on 32-bit floating point formats.

Google identified GRAPE-3 as a prior art system in its preliminary invalidity contentions, and in its post-claim construction invalidity contentions as to which the Court granted leave to amend. Dkt. Nos. 377-11, 377-26 (Gannon Decl. Exs. H, W); Dkt. No. 375. Google seeks to

¹⁵ Junichiro Makino, *GRAPE and Project Milkyway*, Journal of the Korean Astronomical Society, Vol. 38, No. 2 (2005).

present GRAPE-3 at trial as a single, system prior-art reference that invalidates the asserted claims of the '273 patent by anticipation and the asserted claims of the '156 patent by anticipation and/or obviousness, based on the following evidence:

- The testimony of Google expert John Gustafson regarding his having seen a GRAPE-3 at the 1992 International Conference for High Performance Computing, Networking, Storage and Analysis (also known as “Supercomputing '92” or “SC '92”) which was held in Minneapolis, Minnesota, USA, and regarding the number of execution units performing at least the operation of multiplication on 32-bit floating point formats that were present in the types of host computers used with the GRAPE-3. J.G. Decl. ¶ 20.
- The Okamura 1992 and 1993 articles describing the various elements of the GRAPE-3 system
- The Makino 2003 and Makino 2005 articles that provide background regarding GRAPE systems in general, including GRAPE-3

Google could *not* have asserted the GRAPE-3 system-based prior art in IPR, and thus IPR estoppel does not apply. In particular, the unitary nature of Google’s GRAPE-3 ground is unique to system-based prior-art invalidity grounds like “public use.” Even if certain *evidence* for those grounds could have theoretically been used to advance a patent-or-printed-publication ground of invalidity, “[p]roduct prior art invalidates a claim under a different statutory provision than patents or printed publications.” *In re Koninklijke Philips Pat. Litig.*, 2020 WL 7392868, at *27 (N.D. Cal. April 13, 2020) (finding IPR estoppel inapplicable to prior-art product ground). Specifically, “[u]nder 35 U.S.C. § 102, a patent or printed publication anticipates a claim if it ‘describe[s]’ the claimed invention.” “[P]roduct prior art,” by contrast, “anticipates if it shows the invention was ‘in public use’ or ‘on sale’ prior to the filing date.” *Id.* Because “in an IPR, some of the evidence would have been unavailable,” Google “could not have brought its product prior art invalidity grounds using the same theory, evidence, and arguments,” and the GRAPE-3 anticipatory prior-art system “constitute[s] [a] different ‘ground[].’” *Id.* For these reasons, Singular’s motion should be denied as to the GRAPE-3 system.

Plainly, the evidence Google intends to rely on extends far beyond any patents and printed publications permitted to be raised as part of an IPR proceeding. Having not addressed *any* of this evidence in its motion, Singular has not and cannot carry its summary-judgment burden of conclusively showing the absence of any genuine issue of fact that Section 315(e)(2) bars Google from proving invalidity based on the VFLOAT, CNAPS, or GRAPE-3 systems.

2. This Court’s *SiOnyx* decision confirms that Google’s current invalidity grounds are not subject to IPR estoppel.

Google’s three prior-art systems are not materially different from the prior-art product that this Court in *SiOnyx* found to be outside the scope of estoppel. The technology at issue in *SiOnyx* involved a device that improves the detection of near-infrared light. 330 F. Supp. 3d at 581. The defendants’ invalidity contentions cited as prior art a sensor that was described in a publicly available datasheet and in a nonpublic manufacturing specification containing information about “the internal layers of the device” and “the manufacturing steps”—information not included in the publicly available datasheet. *Id.* at 591–92. The invalidity contentions stated that the sensor, combined with three prior-art printed-publication references that the defendants had cited in an IPR petition challenging the same patent, rendered some of the asserted patent claims invalid for obviousness. *Id.* at 599, 603. But the defendants’ IPR petition had *not* included the physical sensor itself as a prior-art reference because, as the Court observed, a physical device is neither a patent nor a “printed publication” under Section 311(b). *Id.* at 603.

Plaintiff SiOnyx sought summary judgment of validity based on IPR estoppel, arguing that the defendants should be estopped from citing the sensor as prior art. *Id.* at 594, 603. Defendants countered that they could not be estopped from using the sensor as prior art because Section 311(b) did not allow them to assert in their IPR petition that a physical device (like the disputed physical sensor) rendered the claims unpatentable. SiOnyx responded in turn that the defendants were not

actually relying on the physical sensor but on its publicly available printed datasheet, which reasonably could have been included in the IPR petition as a ground for unpatentability because it was a printed publication. *Id.* at 603-04.

This Court rejected SiOnyx's estoppel argument and denied its motion for summary judgment, reasoning: "If defendants were relying on the datasheet alone, this might be a close question, as several courts have held that a party may not escape estoppel by dressing up a ground based on publicly available datasheets as a ground based on a product." *Id.* at 603. But the Court concluded that was not the case, because the defendants "also relied on [the] manufacturing specification, which is the only [invalidity] citation for certain claim limitations." *Id.* The Court further found a genuine fact issue as to whether the manufacturing specification was nonpublic and therefore not citable in the IPR proceeding. *Id.* The Court accordingly concluded that SiOnyx "ha[d] not carried its burden to show that publicly available materials are the 'real' references that defendants are now trying to pass off as the product itself." *Id.* at 603–04.¹⁶

SiOnyx is remarkably similar to the facts here. Like in *SiOnyx*, Google is relying on non-printed-publication evidence to establish that each of the VFLOAT, CNAPS, and GRAPE-3 systems anticipate or, in combination with other references, render obvious the two asserted claims based on public knowledge of the systems, their public use, and/or their prior invention. For example, Dr. Leeser's testimony concerning both the functionality and public availability and disclosure of and relating to her VFLOAT computing system as well as Dr. Hammerstrom's similar testimony concerning his CNAPS computer system are sources of evidence Google simply

¹⁶ This Court further held that, although the defendants' expert had not examined the physical sensor itself, he could rely on the combination of the publicly available datasheet and the nonpublic manufacturing specification to "form his opinion that the publicly available [physical sensor] product (in combination with other references) [met] the elements of the claims." *Id.* at 604.

could not have raised in its IPR petitions—just like the non-public manufacturing specification in *SiOnyx*. Likewise, Singular has failed to establish that the VFLOAT source code—which will help show that the system meets certain limitations of the asserted claims—is a printed publication that could have been raised in an IPR petition. *See SRI Int'l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1194-95 (Fed. Cir. 2008) (setting forth the standard for public accessibility and denying summary judgment where dispute of material fact existed as to reference's accessibility). Singular has also not explained how—much less conclusively established that—Google could have used in its IPR petitions either Dr. Hammerstrom's deposition testimony or the non-public documents he produced in this case describing CNAPS, which Google intends to use to show that the system satisfies elements of the asserted claims. And, finally, for the GRAPE-3 system, Google intends to use, in part, Dr. Gustafson's percipient testimony as to the system's use in the United States, *see J.G. Decl.* ¶ 20; again, this testimony supports Google's prior-art system ground but could not have been raised as a basis for invalidating the claims during the IPR proceedings. Just as summary judgment was improper in *SiOnyx*, it is improper here too.

3. Singular's Cited Caselaw is Distinguishable Because Google Relies on Evidence Other than Printed Publications to Prove its System-Based Prior-art Invalidity Grounds.

Singular leans heavily on *Wasica Finance GmbH v. Schrader Int'l, Inc.*, 432 F. Supp. 3d 448 (D. Del. 2020), for its argument that Google is estopped from relying on prior-art systems if they are “cumulative” of patents or printed publications that describe the system and could have been asserted in IPR. Mot. at 7. But even if *Wasica*'s “cumulative” test were appropriate despite lacking any foundation in the language of Section 315(e)(2), *Wasica* is distinguishable.

The *Wasica* court held that defendant Schrader was estopped under Section 315(e)(2) from asserting an obviousness combination that was based on physical tire-pressure sensors plus 15 patents, only one of which Schrader had cited in an IPR. *Wasica*, 432 F. Supp. 3d at 452, 455.

Schrader did not dispute that it could have raised in the IPR the 14 additional patents as well as a published article that disclosed all of the relevant features of the physical sensors. *Id.* at 453. These admissions enabled the court to frame the estoppel question as follows: “[W]hether an obviousness combination—whose *only relevant difference* from a prior IPR combination is the inclusion of a physical product as one component, where *all the relevant features* of that physical product had been disclosed in a patent or printed publication that reasonably could have been raised during the IPR—is estopped as a ‘ground’ that ‘reasonably could have been raised’ during the IPR.” *Id.* at 453 (emphasis added). The court emphasized that the physical product was “*entirely cumulative*” to the patents and printed publication that were or could have been raised in the IPR proceeding. *Id.* Having framed the question thusly, the court had no difficulty in answering: Yes, Schrader was estopped.

Wasica is easily distinguishable on its facts. As discussed above, all three systems on which Google seeks to rely involve non-cumulative evidence that could not have been presented in the IPR proceeding including source-code (VFLOAT), confidential documents (CNAPS), and witness testimony bearing on the functionality of the systems and confirming their public availability (VFLOAT, CNAPS, and GRAPE-3). Accordingly, this Court should reject Singular’s *Wasica*-based “cumulativeness” argument.

The other cases Singular cites (Mot. at 7-8) are likewise distinguishable and further confirm that IPR estoppel is not proper in this case. For example, the district court in *Biscotti, Inc. v. Microsoft Corp.*, 2017 WL 2526231, at *8 (E.D. Tex. May 11, 2017) cautioned the defendant not to “disguise” its prior-art printed-publication grounds as prior-art system grounds. As set forth *supra* Section II.B.1, Google is not disguising a printed-publication ground as a prior-art system ground, it is simply using printed publications as one source of evidence (out of several) to

establish that each of three separate prior-art computer systems anticipate or render obvious the asserted claims. Google’s evidence and invalidity theories go well beyond the patent-or-printed-publication-based grounds that are permissible in IPRs. Likewise, the district court in *Avanos Medical Sales, LLC v. Medtronic Sofamor Danek USA, Inc.*, 2021 WL 8693677, at *2 (W.D. Tenn. Oct. 8, 2021), found IPR estoppel barred a prior-art-product ground because the non-printed-publication materials the defendant relied upon only provided more details of disclosures already adequately disclosed in the printed-publication materials. Here, as explained *supra* Section II.B.1, the non-printed-publication materials that Google relies on (e.g., witness testimony, source code) address aspects of the asserted claims that the printed-publication materials do not. Finally, the district court in *California Institute of Technology v. Broadcom, Ltd.*, 2019 WL 8192255, at *8 (C.D. Cal. Aug. 9, 2019) only held that a non-estopped “known or used” prior-art ground needed to have “some substantive difference” between it and a printed-publication prior-art ground. Here, as explained above, Google’s three prior-art system grounds are different from any printed-publication grounds that could have been pieced together based on the printed publications Google cites as evidence as to how the systems worked.¹⁷ *Supra* Section II.B.1.

4. IPR Estoppel Would Not Apply Even if Google Was Relying Only on Printed Publication Evidence to Establish its System-based Prior-art Invalidity Grounds.

As both *Wasica* and this Court in *SiOnyx* recognized, district courts are split on whether IPR estoppel bars defendants from asserting system-based prior-art invalidity grounds where the only evidence supporting those grounds are printed publications, and the Federal Circuit has not yet spoken on the question. *Wasica*, 432 F. Supp. 3d at 453-454; *SiOnyx*, 330 F. Supp. 3d. at 603.

¹⁷ Singular also cites *Parallel Networks Licensing, LLC v. IBM Corp.*, 2017 WL 1045912, at *11-12 (D. Del. Feb. 22, 2017), but that case does not address prior-art product grounds at all.

If the Court were to reach this question—which it need not do because Google’s actual invalidity grounds are ***not*** based exclusively on prior-art printed publications—it should conclude, as many district courts have, that IPR estoppel does not apply in such circumstances. *See, e.g., Polaris Indus., Inc. v. Arctic Cat. Inc.*, 2019 WL 3824255, at *2-3 (D. Minn. Aug. 15, 2019) (rejecting IPR estoppel of obviousness combinations involving vehicles, rejecting contention that defendant “reasonably could have raised those grounds during [IPR] using the manuals of the physical vehicles instead of the vehicles themselves”); *Zitovault, LLC v. IBM Corp.*, 2018 WL 2971178, at *4 (N.D. Tex. Apr. 4, 2018) (“Defendants . . . could not have raised prior art systems, such as products and software, during IPR proceedings Defendants can rely on the prior art systems in their invalidity contentions to argue anticipation or obviousness.”); *In re Koninklijke Philips*, 2020 WL 7392868, at *27 (“ASUS [] could not have brought its product prior art invalidity grounds using the same theory, evidence, and arguments in the IPR, and they constitute different ‘grounds.’”); *Chemours Co. FC, LLC v. Daikin Indus., Ltd.*, 2022 WL 2643517, at *1-2 (D. Del. July 8, 2022) (“In the absence of guidance from the Supreme Court or the Federal Circuit, this Court aligns with those courts that have adhered more closely to the statutory language.”).

Two statutory provisions are relevant to IPR estoppel. The first is 35 U.S.C. § 311(b):

A petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent **only on a ground that could be raised under section 102 or 103 and only on the basis of patents and printed publications.**

The second, 35 U.S.C. § 315(e)(2), states:

The petitioner in an inter partes review of a claim in a patent under this chapter that results in a final written decision under section 318(a), or the real party in interest or privy of the petitioner, may not assert either in a civil action arising under section 1338 of title 28...that the claim is invalid on any ground that the **petitioner raised or reasonably could have raised during that inter partes review.**

As the plain language makes clear, Section 315(e)(2)’s estoppel provision must be read together with Section 311(b)’s scope provision because the estoppel is defined by the grounds that

were “raised or reasonably could have been raised.” That is, the “patents and printed publications” scope permitted as grounds for an IPR under Section 311(b) is the scope of any resulting IPR estoppel imposed by Section 315(e)(2)—no more.

VFLOAT, CNAPS, and GRAPE-3 are *systems*, not “patents” or “printed publications.” None of these systems could have been the basis—even in part—of a ground under Section 311(b) because the statute lets petitioners seek IPR “only on the basis of patents and printed publications.” IPR estoppel thus cannot apply to system-based grounds. The plain language of Sections 311(b) and 315(e)(2) dictates that estoppel applies *only* to patent-or-printed-publication-based grounds, not system-based grounds. The statute says nothing about estopping reliance on system-based grounds simply because they are purportedly cumulative of printed-publication-based grounds that could have been raised. *See Chemours Co.*, 2022 WL 2643517, at *2 (“Congress could have dictated that estoppel applies to products covered by the paper art underlying the IPR where the paper art discloses the same claim limitations as the product. But Congress did not do so. Adhering to well-accepted canons of construction, it is not for this Court to ignore Congress's omission and create additional bases for estoppel.”).

Indeed, Congress’s use of two restrictive terms in Section 311(b)—“only” and “consisting of”—emphatically confirms that a petitioner may only raise in an IPR an invalidity “ground” that is based exclusively on patents or printed publications. Singular cites not a single Patent Trial and Appeal Board (PTAB) decision—and there are none—instituting IPR on a ground that was based even in part on a prior-art system being known or used under Section 102(a), in public use under Section 102(b), or constituting prior invention under 102(g)(2), which is unsurprising because Section 311(b) inflexibly cabins the grounds that can be advanced in IPR. In fact, the PTAB has repeatedly rebuffed efforts to assert grounds in IPR that fall outside Section 311(b), such as

product-based prior invention under Section 102(g)(2). *E.g., Becton, Dickinson & Co. v. Baxter Corp.*, 2019 WL 1979703, at *7 (P.T.A.B. May 3, 2019) (“Although Alexander is a printed publication, Petitioner does not seek to use it as such under § 102(g)(2) but, instead, as evidence of prior invention, which is not a legitimate basis for challenge in *inter partes* review.”). By the same logic, an invalidity ground **not** based exclusively on patents or printed publications should not be subject to IPR estoppel under Section 315(e)(2). Tellingly, Congress opted to limit the grounds that could be raised in IPR (and thus, the scope of the corresponding estoppel) to a narrower category of invalidity grounds than what can be raised in the closely related post-grant review (PGR) proceedings. *See* 35 U.S.C. § 321(b) (permitting PGR to be instituted on “any ground” of unpatentability). Had Congress wanted system-based prior art to be eligible grounds for IPR (as in PGR) and for IPRs to trigger estoppel of system-based grounds (as PGRs do), it knew well how to structure the statute to accomplish that, but plainly chose not to.

Although the Federal Circuit has not squarely addressed whether IPR estoppel applies to system-based invalidity grounds relying exclusively on printed publications, it has suggested estoppel would not apply. *See, e.g., Synopsys, Inc. v. Mentor Graphics Corp.*, 814 F.3d 1309, 1316 (Fed. Cir. 2016) (explaining IPR “cannot replace the district court in all instances, for example, when claims are challenged in district court as invalid based on the on-sale bar”); *Mikkelsen Graphic Eng’g, Inc. v. Zund Am., Inc.*, 541 F. App’x 964, 973-974 (Fed. Cir. 2013) (explaining, in context of *inter partes* reexamination’s similar estoppel provision that “resulting estoppel” is “limited” where defendant is advancing a prior-art product defense).

III. CONCLUSION

The Court should deny Singular’s motion for partial summary judgment.

Respectfully submitted,

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By: /s/ Nathan R. Speed
Gregory F. Corbett (BBO #646394)
gcorbett@wolfgreenfield.com
Nathan R. Speed (BBO # 670249)
nspeed@wolfgreenfield.com
Elizabeth A. DiMarco (BBO #681921)
edimarco@wolfgreenfield.com
Anant K. Saraswat (BBO #676048)
asaraswat@wolfgreenfield.com
WOLF, GREENFIELD & SACKS, P.C.
600 Atlantic Avenue
Boston, MA 02210
Telephone: (617) 646-8000
Fax: (617) 646-8646

Robert Van Nest (admitted *pro hac vice*)
rvannest@keker.com
Michelle Ybarra (admitted *pro hac vice*)
mybarra@keker.com
Andrew Bruns (admitted *pro hac vice*)
abrunz@keker.com
Vishesh Narayen (admitted *pro hac vice*)
vnarayen@keker.com
Christopher S. Sun (admitted *pro hac vice*)
csun@keker.com
Anna Porto (admitted *pro hac vice*)
aporto@keker.com
Deeva Shah (admitted *pro hac vice*)
dshah@keker.com
Stephanie J. Goldberg (admitted *pro hac vice*)
sgoldberg@keker.com
KEKER, VAN NEST & PETERS LLP
633 Battery Street
San Francisco, CA 94111-1809
Telephone: (415) 391-5400

Michael S. Kwun (admitted *pro hac vice*)
mkwun@kblfirm.com
Asim M. Bhansali (admitted *pro hac vice*)
abhansali@kblfirm.com
KWUN BHANSALI LAZARUS LLP
555 Montgomery Street, Suite 750
San Francisco, CA 94111
Telephone: (415) 630-2350
Fax: (415) 367-1539

Matthias A. Kamber (admitted *pro hac vice*)
matthiaskamber@paulhastings.com
PAUL HASTINGS LLP
101 California Street, 48th Floor
San Francisco, CA 94111
Telephone: (415) 856-7000
Fax: (415) 856-7100

Counsel for Defendant Google LLC

CERTIFICATE OF SERVICE

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/s/ Nathan R. Speed

Nathan R. Speed